



## PE77K Series 3.3 V PECL Clock Oscillators

November 2018

**Lead Free** 

- Pletronics' PE77K Series is a quartz crystal controlled precision square wave generator with a PECL output.
- Improved phase noise performance.
- Low cost mass produced oscillator.
- Tape and Reel or cut tape packaging is available.
- 5 x 7 mm LCC Ceramic Package
- Enable/Disable Function on pad 1
- Disable function includes low standby power mode
- 3<sup>rd</sup> Overtone Crystals used
- Improved circuit to minimize oscillator issues such as multi-mode output signal.
- Lowest Jitter Product

**\* BEST OPTION FOR LOW JITTER REQUIREMENTS  
50 fS Litter 12 KHz - 20 MHz @156.25 MHz**

**Pletronics Inc. certifies this device is in accordance with the  
RoHS 6/6 (2011/65/EC) and WEEE (2002/96/EC) directives.**

Pletronics Inc. guarantees the device does not contain the following:

Cadmium, Hexavalent Chromium, Lead, Mercury, PBB's, PBDE's

Weight of the Device: 0.16 grams

Moisture Sensitivity Level: 1 As defined in J-STD-020D.1

Second Level Interconnect code: e4

### Absolute Maximum Ratings:

Parameter	Unit
V <sub>CC</sub> Supply Voltage	-0.5V to +4.6V
V <sub>i</sub> Input Voltage	-0.5V to V <sub>CC</sub> + 0.5V
V <sub>o</sub> Output Voltage	-0.5V to V <sub>CC</sub> + 0.5V

### Thermal Characteristics

The maximum die or junction temperature is 125°C

The thermal resistance junction to board is 30 to 50°C/Watt depending on the solder pads, ground plane and construction of the PCB.



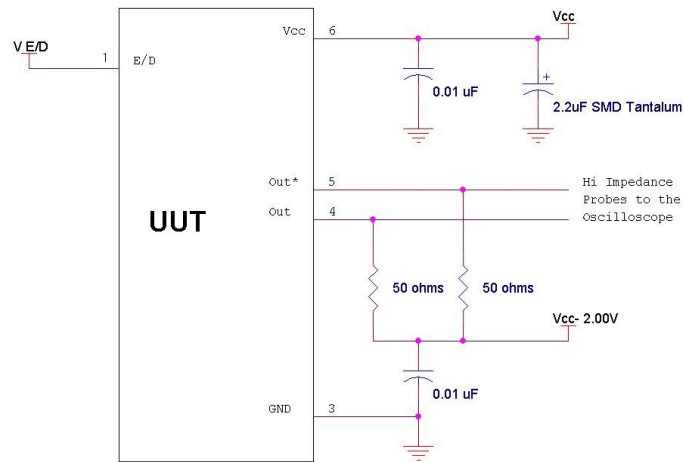
## Electrical Specification for 3.30V $\pm 5\%$ over the specified temperature range and the frequency range of 100.0 to 212.50 MHz

Item	Min	Typ	Max	Unit	Condition
Frequency Accuracy "45"	-50	-	+50	ppm	For all supply voltages, load changes, aging for 1 year, shock, vibration and temperatures
"44"	-25	-	+25		
"20"	-20	-	+20		
Output Waveform	PECL /ECL				
Output High Level	2.215	2.350	2.420	V	$V_{CC} = 3.3 V$
Output Low Level	1.490	1.600	1.745	V	$V_{CC} = 3.3 V$
Output Symmetry	45	-	55	%	at 50% point of $V_{CC}$ (See load circuit)
Jitter <sup>1</sup>	-	50	-	fs RMS	12 KHz to 20 MHz from the output frequency @156.25 MHz
Output $T_{RISE}$ and $T_{FALL}$	-	.4	1.1	ns	Vth is 20% and 80% of waveform
$V_{CC}$ Supply Current ( $I_{CC}$ )	-	47	70	mA	
Enable/Disable Internal Pull-up	50	-	-	Kohm	to $V_{CC}$ , measured with Pad 1 = 0.0 volts
V disable	-	-	20	%Vcc	
V enable	20	-	-	%Vcc	
Output leakage	-10	-	+10	$\mu A$	
Enable time	-	-	2	ms	Time for output to reach a logic state, the output frequency is correct at the specified Start Time.
Disable time	-	-	200	ns	Time for output to reach a high Z state
Start up time	-	-	3	ms	Time for output to reach specified frequency
Operating Temperature Range	-10	-	+70	$^{\circ}C$	Standard Temperature Range
	- 20	-	+70	$^{\circ}C$	Extended Temperature Range "C" Option
	- 40	-	+85	$^{\circ}C$	Extended Temperature Range "E" Option
Storage Temperature Range	-55	-	+125	$^{\circ}C$	
Standby Current $I_{CC}$	-	-	30	$\mu A$	Pad 1 low, device disabled

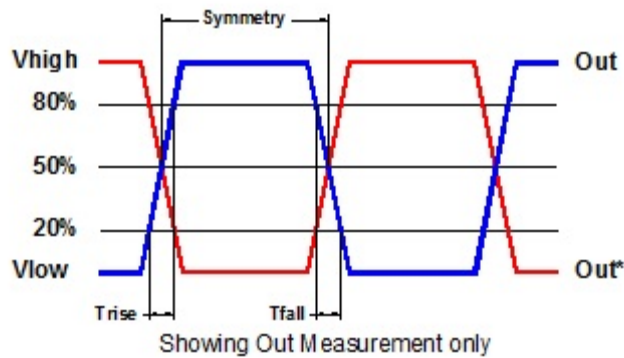
<sup>1</sup> Jitter computed from phase noise data at 156.25MHz

Specifications with Pad 1 E/D open circuit unless stated otherwise

**Load Circuit**



**Test Waveform**



## Reliability: Environmental Compliance

Parameter	Condition
Mechanical Shock	MIL-STD-883 Method 2002, Condition B
Vibration	MIL-STD-883 Method 2007, Condition A
Solderability	MIL-STD-883 Method 2003
Thermal Shock	MIL-STD-883 Method 1011, Condition A

## ESD Rating

Model	Minimum Voltage	Conditions
Human Body Model	1500	MIL-STD-883 Method 3115
Charged Device Model	1000	JESD 22-C101

## Package Labeling

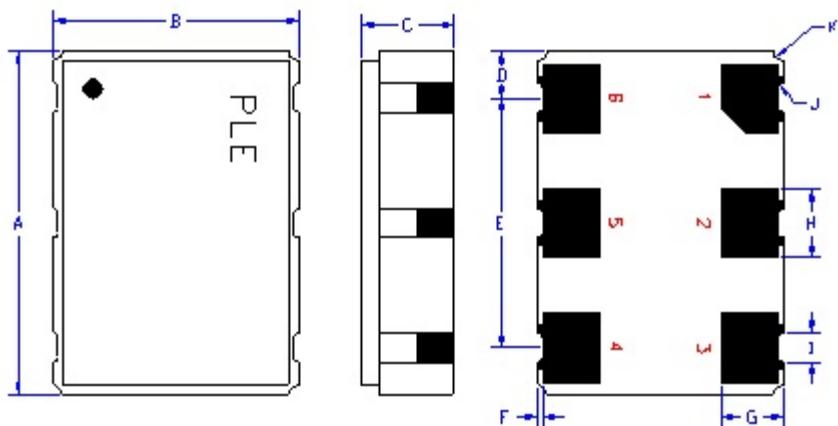
Label is 1" x 2.6" (25.4mm x 66.7mm)  
Font is Courier New  
Bar code is 39-Full ASCII

Label is 1" x 2.6" (25.4mm x 66.7mm)  
Font is Arial

<b>P/N:</b>  PE7745KV-156.25M <b>Customer P/N:</b>  12345678 <b>Qty:</b>  1000 <b>D/C</b>  6KX-SG MSL: 1
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<b>RoHS Compliant</b> 2nd LvL Interconnect Category=e4 Max Safe Temp=260C for 10s 2X Max
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## Mechanical:



Not to Scale

<sup>1</sup> Typical dimensions

	Inches	mm
A	0.276 $\pm$ 0.006	7.00 $\pm$ 0.15
B	0.197 $\pm$ 0.006	5.00 $\pm$ 0.15
C	0.067 max	1.80 max
D <sup>1</sup>	0.038	0.96
E <sup>1</sup>	0.200	5.08
F <sup>1</sup>	0.004	0.10
G <sup>1</sup>	0.050	1.27
H <sup>1</sup>	0.055	1.40
I <sup>1</sup>	0.024	0.60
J <sup>1</sup>	0.004R	0.10R
K <sup>1</sup>	0.008R	0.20R

## Contacts (pads) :

Gold 11.8 to 39.4  $\mu$ mches (0.3 to 1.0  $\mu$ m) over Nickel 50 to 350  $\mu$ mches (1.27 to 8.89  $\mu$ m)

Pad	Function	Note
1	Output Enable/Disable	When this pad is not connected the oscillator shall operate. When this pad is <0.30 volts, the output will be inhibited (high impedance state.) Recommend connecting this pad to $V_{CC}$ if the oscillator is to be always on.
2	No connect	There is no internal connection to this pad
3	Ground (GND)	
4	Output	Both outputs must be terminated and biased for proper operation. The ideal termination is 50 ohms connected to 2.0V below the Supply Voltage.
5	Output*	
6	Supply Voltage ( $V_{CC}$ )	Recommend connecting appropriate power supply bypass capacitors as close as possible.



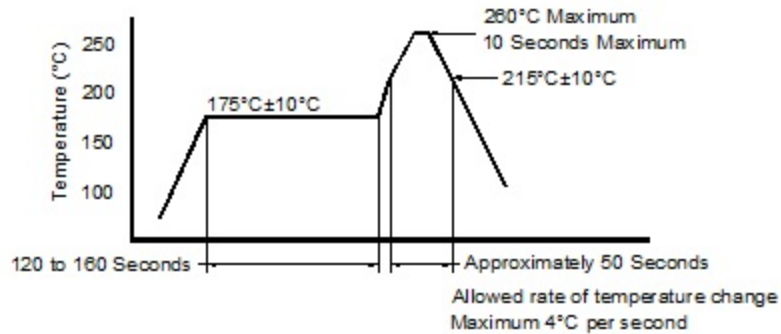
## Layout and application information

Recommend connecting Pad 1 and Pad 2 together to permit the design to accept Enable/Disable input on either pad

For Optimum Jitter Performance, Pletronics recommends:

- a ground plane under the device
- no large transient signals (both current and voltage) should be routed under the device
- do not layout near a large magnetic field such as a high frequency switching power supply
- do not place near piezoelectric buzzers or mechanical fans.

## Reflow Cycle (typical for lead free processing)



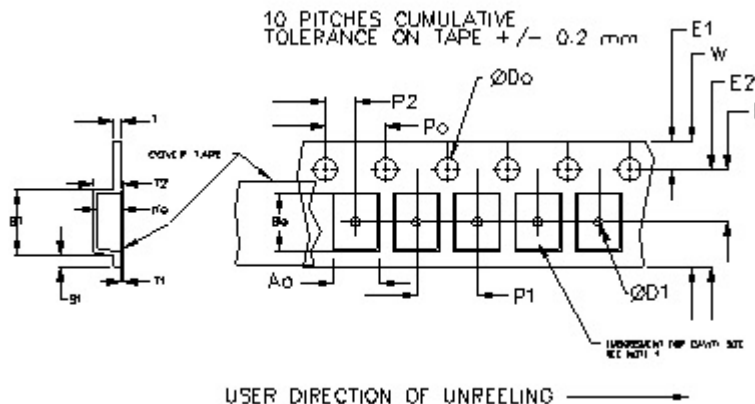
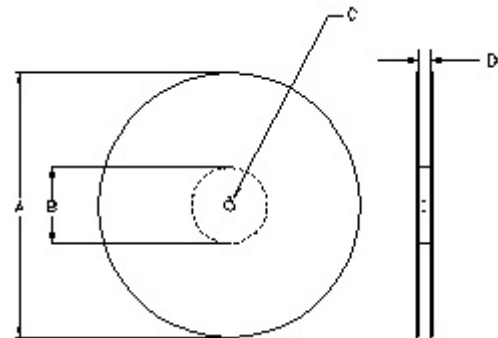
The part may be reflowed 3 times without degradation.

## Tape and Reel: available for quantities of 250 to 1000 per reel, cut tape for < 250

Constant Dimensions Table 1								
Tape Size	D0	D1 Min	E1	P0	P2	S1 Min	T Max	T1 Max
8mm	1.5	1.0	1.75	4.0	2.0 ±0.05	0.6	0.6	0.1
12mm		1.5			2.0 ±0.1			
16mm		+0.1 -0.0			1.5			
24mm		1.5			1.5			

Variable Dimensions Table 2							
Tape Size	B1 Max	E2 Min	F	P1	T2 Max	W Max	Ao, Bo & Ko
16 mm	12.1	14.25	7.5 ± 0.1	8.0 ± 0.1	8.0	16.3	Note 1

Note 1: Embossed cavity to conform to EIA-481-B      Dimensions in mm      Not to scale



		REEL DIMENSIONS			
A	inches	7.0	10.0	13.0	
	mm	177.8	254.0	330.2	
B	inches	2.50	4.00	3.75	Tape Width
	mm	63.5	101.6	95.3	
C	mm	13.0 +0.5 / -0.2			
D	mm	16.4	16.4	16.4	16.0
		+2.0 -0.0	+2.0 -0.0	+2.0 -0.0	

Reel dimensions may vary from the above

## IMPORTANT NOTICE

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